

THE PROGRESS
OF DENTISTRY.

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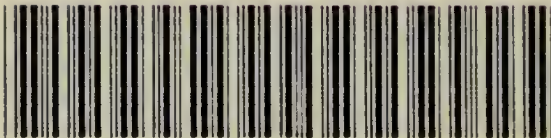
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AND

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THE PROGRESS
OF DENTISTRY.

THE PROGRESS OF DENTISTRY.

A Treatise on the Hygiene of the Mouth and
the Prevention of Dental Disease, with Advice
on the Latest and Best Methods of Treatment.

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PREFACE.

It is very unsatisfactory to find that after fifty years of progressive dentistry the teeth are of infinitely poorer type than before the introduction of the tooth-brush and the advent of modern dentistry.

In the following pages we refute the universally accepted explanation that the present degeneration of the teeth is entirely due to the artificial diet and mode of living which civilized man has adopted, and is therefore unavoidable. Our grandparents were not savages, yet they possessed excellent teeth.

We will show that decay of the teeth is preventable—by due regard to common-sense hygiene, which includes *the daily sterilization by boiling* of everything used in the mouth, viz., tooth-brushes, artificial

teeth, &c., and that until this is done the present rapid degeneration of the teeth will continue.

For those who cannot spare the time to read the book through we have appended a summary of the contents at the end.

J. J. WEDGWOOD.

LLOYD T. LAVAN.

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THE PROGRESS OF DENTISTRY.

CHAPTER I.

DEGENERATION OF THE TEETH: ITS CAUSE AND CURE.

DECAY of the teeth has been described and treated from time immemorial, and is more prevalent in civilized than in savage races.

It is generally believed to be due to the artificial diet and mode of living which civilized man has adopted, and therefore unavoidable. We will, however, in the following pages refute this theory, and show that decay of the teeth is preventable

—by due regard to common-sense hygiene, which includes *the daily sterilization by boiling* of everything used in the mouth, viz., tooth-brushes, artificial teeth, &c. Until this is done the present rapid degeneration of the teeth will continue.

Two independent factors are at work in the destructive process—(1) the disintegration of the enamel by acids produced by the decomposition of particles of food, or by abnormal acidity of the saliva due to gout, rheumatism, dyspepsia, mental strain, and many other causes; and (2) the presence of bacteria (usually a germ called *Leptothrix*), the commonest vehicle of infection being the tooth-brush, which, being laden with germs, reinfects the mouth and teeth each time it is used.

Decay varies so much in rapidity and extent in different mouths that all we can say in a general way is that long before the patient has the least idea that anything is wrong with a tooth considerable damage has usually been done.

The Prevention of Decay.

Dr. Taft, an American authority, says: "I doubt not that three-fourths of the diseases of the mouth and teeth are preventable. It is a dentist's bounden duty to do whatever will minister to the best interests of his patient, not only in respect to restoration, repair, and remedy, but also to *prevention*."

Another American expert, Dr. C. R. Taylor, says: "If we are to do our duty as professional men the work of the future will be preventive rather than curative."

Dr. C. H. Ward, writing in the "Dental Office and Laboratory," says: "The African negro pays much more attention to keeping his teeth clean than does the average European. The Bafote, of the Loango Coast, for example, rinse the mouth after each meal. The Patagonians of South America keep their teeth clean and white by chewing a sort of gum."

Dr. Talbot, of Chicago, an authority on this subject, says: "The nearer the

monkey, and the further removed from refined and civilized man, the better the teeth."

Whilst admitting all this and appreciating its scientific value, we cannot, however, accept the ordinary explanation that the present degeneration of the teeth is unavoidable and due entirely to the artificial diet and mode of living which civilized man has adopted. Our grandparents were not savages, yet they possessed excellent teeth. It is certainly very unsatisfactory to find that after fifty years of progressive dentistry the teeth are now of infinitely poorer type than before the introduction of the tooth-brush and the advent of modern dentistry.

The study of comparative hygiene reveals the remarkable fact that the method employed by savages for the care of their teeth, i.e., the daily use of a freshly cut stick or cane (never used a second time), is scientifically sound, whereas civilized man's use of an unsterilized tooth-brush, which is

nothing less than an ideal incubator of germs, is about as unclean and unhealthy a habit as can be imagined.

As ordinarily used the tooth-brush is most harmful to the teeth, except the very strongest, which are able to resist all adverse influences. In fact, our investigations show that the present all but universal prevalence of decay may largely be traced to its use, or, rather, to its improper use. For though it is an excellent agent for removing particles of food from between the teeth it is also unfortunately laden with germs, and each time it is used, unless it be effectively sterilized, it reinfects the mouth and teeth.

For the development of bacteria the following factors are necessary—particles of food, warmth, moisture, and air. All these are present in the tooth-brush.

Sterilization of the Tooth-brush.

Immersing the brush in an ordinary antiseptic mouth-wash is quite useless. A

tooth - brush can only be effectively sterilized by boiling for ten minutes. By having two or three in use one will always be dry.

That the rôle which the tooth-brush is playing in the infection and destruction of the teeth should have remained so long unsuspected is well-nigh astounding.

During the many years that we have been engaged in the practice of dentistry, including extensive hospital experience, it has always seemed strange to us that the best sets of teeth are not found amongst those who pay most attention to the cleanliness of their mouths.

Others have noticed this, but not suspecting the real cause of the mischief, have advised the discontinuance of the use of the tooth-brush. It is, however, by far the best agent for cleansing the teeth, and when sterilized its use will be attended with benefit to both the teeth and the gums.

Dr. Henry Campbell, M.D., F.R.C.P.,
Physician to the North-West London

Hospital, writing in the "British Journal of Dental Science," says: "Certain it is that some of the best sets of teeth I have encountered have been wholly unacquainted with the tooth-brush."

The paradox remained unexplained until Mr. Lavan's recent investigations and experiments revealed the true cause of the present degeneration of the teeth, viz., septic infection by unsterilized tooth-brushes and artificial dentures (plates), the deterioration becoming accentuated in each succeeding generation by heredity.

Sterilizer for Tooth-brushes, &c.

Though boiling ordinary tooth-brushes in any vessel is all that is required to render them aseptic, i.e., germ-free, we have devised a sterilizer and special tooth-brushes which will withstand the necessary heat, as frequent boiling damages ordinary tooth-brushes. They can be obtained through any chemist, or direct from

Messrs. Keene and Ashwell, 6, South Molton Street, W.

Sterilization of Artificial Teeth.

Artificial teeth should be so constructed that their sterilization by boiling is possible, as cleansing in the ordinary way, no matter what care be taken, leaves them septic and infective, not only to the remaining natural teeth, which generally become undermined and destroyed in consequence, but also to the throat, lungs, stomach, &c., often ending by setting up a very insidious form of chronic poisoning, which, though hardly perceptible to the wearer, is yet sufficient to lower his vitality and increase his susceptibility to any disease to which he may be exposed.

Plates as ordinarily made cannot be sterilized, as boiling would irremediably damage them. The only cases in which it is difficult to construct sterilizable dentures are when all the teeth have been lost and vulcanite suction plates are worn. Though

suction is most quickly and easily obtained by the use of vulcanite, we consider its replacement by a sterilizable material essential to health, even at the cost of some initial patience.

The sterilizer mentioned above is so constructed that any kind of denture can be rendered aseptic, i.e., germ-free, in a few minutes.

After brushing, the tooth-brush and any artificial teeth worn should be sterilized.

The above directions apply in a general way to normal mouths, but in practice we prescribe a tooth-brush, powder, and mouth-wash to suit the special requirements of each patient. In this connection the alkalinity or acidity of the saliva should be noted, for if acidity of the saliva be not corrected by a suitable mouth-wash a very potent predisposing cause of decay has been overlooked.

Not only should the teeth be brushed across, but a rotary motion should be employed, and the upper teeth should be

brushed downwards and the lower teeth upwards. This assists in counteracting any tendency to recession of the gum.

Tooth-powders and Mouth-washes.

It is of the greatest importance that powders and washes used for the teeth and gums should be carefully chosen, for to the indiscriminate use of unsuitable dentifrices, &c., the loss of the teeth may often be traced.

Preparations advertised for whitening the teeth are either incapable of accomplishing what is claimed for them, or do so at the expense of the integrity of the enamel.

For travellers and others who find it inconvenient to carry a supply of liquid dentifrice or mouth-wash, Dr. Wedgwood has devised tablets, one of which dropped into half a tumblerful of water will provide a pleasant and effective liquid dentifrice and mouth-wash.

Messrs. Keene and Ashwell, chemists, 6, South Molton Street, London, W., com-

pound these preparations for the teeth from our formulæ. They can be obtained from them direct, or through any chemist.

Floss-silk is often recommended for the removal of particles of food when the teeth are crowded, but we find that its use often increases the tendency of the gums to recede. Sterilized floss-silk is now supplied in small bottles by leading chemists.

If a tooth-pick be used we recommend the sterilized quill tooth-pick. Each is sterilized, tipped with an antiseptic, and wrapped in a separate paper cover.

If the following rules be observed, decay of the teeth will soon become a much rarer disease than it is to-day :—

1. Brush the teeth gently night and morning with a moderately stiff, *sterilized* tooth-brush (for sterilization see page 7). Rinsing the mouth after each meal or brushing, if particles of food are retained between the teeth, is beneficial, especially when artificial teeth are worn. Too hard

brushing is injurious to the teeth and gums. Cleansing the teeth before retiring at night is especially important, as most of the damage by fermentative and putrefactive processes in the mouth is done during repose.

2. Tooth-powders and mouth-washes should be carefully chosen, for to the indiscriminate use of unsuitable dentifrices, &c., the loss of the teeth may often be traced.

3. All medicines, especially acid mixtures, e.g., tonics, should be taken through a glass tube, and the mouth afterwards thoroughly rinsed out with warm water to which a little bicarbonate of soda has been added, to neutralize any acidity.

4. Irregularity or crowding of children's teeth should be corrected early, as such conditions render the teeth specially liable to decay.

5. Any decay, no matter how slight, should be at once removed, and the tooth scientifically treated and filled.

6. Tartar should be removed at least twice a year, as it is porous and keeps the mouth unhealthy. If neglected it leads to recession of the gum and loosening of the teeth.

7. No avoidable plates should be worn, either to regulate children's teeth or as a base for artificial teeth. Teeth can usually be regulated and artificial ones inserted without wearing plates or other cumbersome and injurious appliances.

8. Hard food, requiring considerable use of the teeth, should be preferred to soft dishes. Hard work helps to keep the teeth sound. Foods containing lime-salts, e.g., wholemeal bread, porridge, &c., are of great value to the teeth. Particles of soft white bread are especially harmful if left between the teeth.

9. Acidity of the saliva arising from debility, dyspepsia, gout, rheumatism, &c., is an important predisposing cause of decay of the teeth, and should be corrected by a suitable mouth-wash.

10. A simple and healthy diet and mode of living conduce to the preservation of the teeth by improving their texture, thereby increasing their resistive power to infection. Plain food, fresh air, outdoor exercise, and wholesome amusement, with avoidance of all dietary, physical, and mental excesses, will do much not only for the general health, but also for the preservation of the teeth.

11. Vaccination during infancy affects the development of the teeth very adversely, and we unhesitatingly condemn its practice at this period.

12. As freedom from pain does not prove absence of disease, and the parts most liable to decay are not easily seen, it is important that the teeth be examined at least twice a year in the case of adults and three times a year in the case of children, beginning not later than the third year.

If *absolute* cleanliness, i.e., sterilization, in the matter of tooth-brushes and artificial teeth be observed, a healthy diet and mode of living adopted, and improper

dentistry and unsuitable preparations avoided, there is no reason why the teeth of future generations should not be as good as those of our ancestors, nor why the teeth of the majority of the present generation should not be retained throughout life.

CHAPTER II.

ARTIFICIAL TEETH.

THE loss of the natural teeth and the consequent absorption of the jaws and contraction of the gums cause a great change in a person's appearance, and the highest degree of artistic skill is often necessary to restore the original contour and expression of the face. An artistic effect is of quite as much importance as utilitarian considerations in the replacement of lost teeth.

The colour, shape, and alignment of artificial teeth should harmonize with the complexion, temperamental characteristics, and facial peculiarities of the wearer. The aged and unnatural look so often seen in those wearing artificial teeth is due to disregard to these obvious relations. Per-

manent disfigurement is only too common a result of the wholesale extraction of teeth.

With all the resources of modern science and art at our disposal, it is possible not only to replace lost teeth by new ones which are absolutely undetectable, but also to restore the natural form and expression of the mouth and face in a perfect and life-like manner. It is true that hideous imitations are often seen, but these are altogether unworthy of modern dental skill, and bring reproach upon the art, creating in the minds of those having a keen sense of the fitness of things doubts as to their utility or propriety; and many artificial teeth which bear inspection reasonably well in daylight have a very unnatural and dull appearance in a strong artificial light.

Methods of Artificial Restoration.

There are at present two systems of replacing lost teeth: the first by fixing the new teeth immovably to the remaining

natural ones, without any plate whatever, and the second by means of plates. The first, which is the original American system, is termed Bridge-work; the second is the method in general use in Europe.

The only objection to Bridge-work is that it is not removable for cleansing.

Since our discovery of the necessity for sterilizing everything used in the mouth we have devised a method of replacing lost teeth which is both hygienic and free from any risk of injury to the remaining natural teeth. As, however, this is quite a technical subject, we will only say that the process is quite painless, and that such dentures are termed "Alveolar Saddles." They are made without any plate in the palate, all healthy roots and savable teeth being retained and utilized for their support. (See Figs. 1 and 2.)

Alveolar Saddles.

This method is as far ahead of ordinary Bridge-work as Bridge-work is ahead of

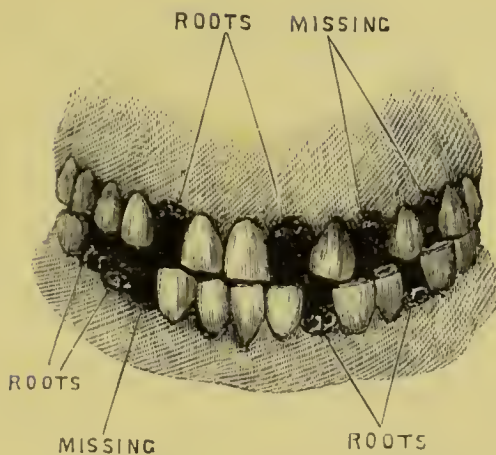


FIG. 1.

Illustrates a case where some teeth are missing and a few roots remaining: taken from a model of a case in practice.

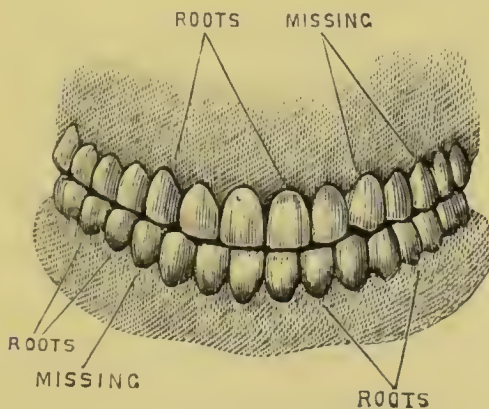


FIG. 2

Shows the same mouth restored.

old-fashioned artificial teeth on plates. It possesses the following advantages:—

1. The wearing of cumbersome plates is obviated.

2. Such dentures are easily removed by the wearer for cleansing and sterilizing.

3. There is no interference with freedom of movement of the tongue, enjoyment of taste, or distinct articulation (speech).

4. Each new tooth is placed over its own socket, so that each takes its own strain, following nature's plan—a point of great importance for both comfort and effective mastication.

The Avoidance of Plates.

The usual method employed in this country to replace lost teeth is by means of a cumbersome plate of vulcanite, platinum, or gold.

Roots and decayed teeth which could be made permanently useful and would be of the greatest value in supporting comfortable and effective artificial teeth are un-

fortunately often heedlessly extracted, necessitating the wearing of plates.

Temporary Dentures.

As some time must necessarily elapse after the extraction of teeth for the gum to contract and harden before durable artificial substitutes can be inserted, we advise the wearing of temporary dentures in order to preserve the natural expression and prevent contraction of the muscles of the cheeks. Some degree of deformity always results if this precaution be not taken.

Reasons for Wearing Artificial Teeth.

When the natural teeth are lost—an event which, thanks to the present advanced state of dental science, now only occurs as the result of persistent neglect or of loosening from such constitutional causes as gout and rheumatism—artificial replacement should be immediately resorted to before the cheeks and lips have had time to fall in or the muscles of the mouth to

contract, otherwise much more difficulty will be experienced in restoring the natural expression and appearance. This applies to the loss of even a single tooth. The teeth are comparable to the staves of a

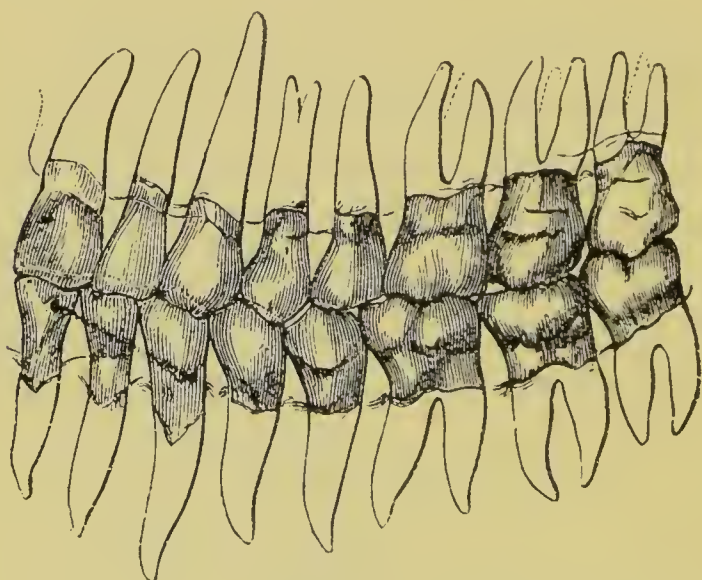


FIG. 3.

barrel, the removal of one causing the others to collapse, and are so arranged that each tooth antagonizes not one, but two teeth in the other jaw, on the plan of the bricklayer's "breaking-joints." (See Fig. 3.)

When a lost tooth is not replaced, the teeth in the other jaw which meet it are gradually protruded and displaced, finally becoming loose, tender, and useless for mastication.

Also, when the back teeth have been missing* for some time, the upper front teeth are slowly pushed outwards, becoming very unsightly, and are ultimately lost through loosening and tenderness.

In elderly people who have lost their teeth the undue closure of the jaws sometimes causes interference with the auditory apparatus, producing deafness; this condition is promptly relieved by a properly adapted denture.

Speech is difficult when the teeth are lost, distinct articulation and continued speaking being all but impossible until scientifically constructed artificial substitutes have been inserted.

Another advantage gained by wearing artificial teeth is that they prevent the sudden influx of cold air to the lungs, often

the exciting cause of bronchial trouble and sometimes also of deafness, owing to partial or complete occlusion of the Eustachian tubes.

A list of reasons for wearing artificial teeth would not be complete without mention of the urgent need of grinding teeth for the proper mastication of food, upon which a sound digestion depends, and the necessity for artistic substitutes to avoid disfigurement.

CHAPTER III.

ART IN DENTISTRY.

IN past ages art was restricted to the representation of human beauty by means of statuary and painting. To-day it is applied to a far higher object—that of restoring beauty and usefulness to the human form when injured or diseased.

In the domain of surgery, noses are built up and moulded by means of flaps of skin to exactly resemble the lost part, ugly scars and sores are completely obliterated, and artificial eyes of very natural appearance and limbs of considerable utility are supplied.

In dentistry there is a wide field for the artistic worker, but up to the present our profession has not attracted many men of highly artistic temperament, hence the low

standard of beauty of many of the artificial teeth we see. The manufacture of artificial teeth, or Prosthetic Dentistry, as it is technically termed, should not be looked down upon, as it so often is, nor relegated to cheap-jacks or incompetent assistants.* Not only is it possible, if sufficient care be taken, to exactly restore the lost teeth, but it is often not difficult, in the present degenerate state of the teeth, to very much improve on the originals. A close observation of the temperamental type, age, and personal peculiarities of the patient is essential to attain perfection in each case. There is no dental service, however, which from the æsthetic standpoint,

* "All works of taste must bear a price in proportion to the skill, taste, time, expense, and risk attending their invention and manufacture. Those things called dear are, when justly estimated, the cheapest; they are attended with much less profit to the artist than those which everybody calls cheap. Beautiful forms and compositions are not made by chance, nor can they ever, in any material, be made at small expense. A competition for cheapness, and not for excellence of workmanship, is the most frequent and certain cause of the rapid decay and entire destruction of arts and manufactures."—JOSIAH WEDGWOOD.

as a rule, leaves so much to be desired as the adaptation of artificial substitutes. Many dentures, though serving the needs of the wearer for speech and mastication, are nevertheless deserving of utter condemnation on account of their unsightliness, due in most cases to failure on the part of the dentist to recognize the requirements of type, age, and sex, disregard of which will result in transparent artificiality. The first study of the dentist who aspires to the dignity of an artist when replacing lost teeth should be how to restore the natural appearance of his patient. A knowledge of the distinguishing characteristics of the various temperaments and the style of teeth associated with each of them marks the difference between the dental mechanic and the dental artist.

For the restoration of the natural teeth by stopping and crowning we now use special enamels, which have all the hardness and durability of gold, amalgam, platinum, &c., but are absolutely undetect-

able, being of exactly the same shades and translucency as the natural teeth. It has taken many years to accomplish this, but the beauty of the results is an ample reward for all the time and labour devoted to the perfection of these enamel fillings and crowns.

CHAPTER IV.

CANCER OF THE MOUTH AND TONGUE ARISING FROM DECAYED TEETH AND ILL-FITTING PLATES.

ALTHOUGH the origin of cancer has not yet been ascertained, it is well known that a blow or the constant irritation of a soft structure, such as the lip or tongue, by a hard, sharp, substance, such as a decayed tooth, is the commonest exciting cause of the disease. Long-continued irritation of the tongue, lip, palate, or gum by jagged teeth, sharp pieces of tartar, or ill-fitting plates frequently ends by setting up malignant disease, especially in persons above forty.

Sir Morell Mackenzie says: "Whether this disease (cancer of the mouth) be con-

stitutional or not in its origin, there can be no question that the determining cause of its appearance is in very many cases an injury such as a blow, or the chafing of the tongue by a jagged tooth."

The tongue is the part of the mouth most frequently attacked.

Looking over our notes of cases, we find that the oldest patient was a lady, aged seventy-eight, and the youngest, also a lady, aged twenty-five. Only one other was under forty, all the rest being between forty and seventy-five. Cancer of the tongue is therefore a disease of middle and old age.

"While cancer rarely attacks the tongue before thirty, it is the commonest form of disease of that organ after forty." ("Lancet.") This corroborates our own observations.

Sir Henry Morris, Bart., M.A., F.R.C.S., President of the Royal College of Surgeons, states that in no less than sixty per cent. of the cases of

cancer of the tongue the disease begins on the edge of the organ, where it is exposed to the irritation of jagged and misplaced teeth, and that it is only when the affection begins in such places as the side of the throat, the inner surface of the jaw, or upon the floor of the mouth, all of which situations are very rare, that the teeth can be altogether excluded as a possible exciting cause of the disease, and even then the origin of the malady is usually due to the irritation produced by an ill-fitting set of artificial teeth, made of cheap and impure materials.

This is a matter to which doctors and dentists alike should pay particular attention.

Many of the patients who have consulted us had long been conscious of the irritation caused by a broken or rough tooth, but only when too late have sought advice. One patient told us that he had been in the habit of filing down the offending tooth; but he had not commenced

the practice in time to save himself from cancer.

There are doubtless other local irritants which may lead to cancer of the tongue, but none is so frequent or so important as a jagged tooth or an ill-fitting plate.

Drinking and smoking, especially when the pipe or cigar is always held in the same place, are thought by some to be exciting causes in persons with an hereditary predisposition to the disease.

Out of sixty-one patients, only nine described themselves as heavy smokers. A few admitted that they were, or had been, intemperate in the use of spirits.

In regard to the communicability of cancer little is definitely known, but the possibility of the conveyance of malignant as well as of other diseases by unclean instruments must not be overlooked. All instruments should be sterilized by boiling for each patient.

The duration of what is termed the period of latency of the cancer, i.e., the

time which elapses between the first appearance of the blister, ulcer, or whatever form the initial stage of the disease may assume, and the time at which the disease begins to spread and take on the characters of malignancy, varies from zero to three or four years. In some cases there seems to be no period of latency, the disease steadily increasing from the first; in most cases, however, the active stage begins from two to three months after the appearance of the initial blister or sore.

The case of the late President Grant stands as a solemn warning to all advancing in years against the retention of any rough surfaces in the mouth, by which the tongue and other tissues may be kept in a state of constant irritation.

Our colleague Dr. Frank Abbott, of New York City, who was dental surgeon in attendance on General Grant, attributed the cause of the malignant disease from which he died to the deplorable condition of his teeth. He says: "Taking into considera-

tion the highly irritable condition of that region of his mouth, the extensive inflammation in the vault and down the side of the throat, the rough and ragged surfaces of broken teeth, and the tartar incrustations against which the side of his tongue was almost constantly rubbing, I feel justified in concluding that this was the cause of the painful disease from which the General died, instead of attributing it to the habit of smoking, which seems to be the prevailing opinion among the laity."

General Grant was a great smoker, and the public concluded that the disease which was slowly but surely eating out the life of this distinguished man was the direct fruit of the cigar, whereas tobacco probably had nothing to do with the origin of the malady.

As to the case of the late Emperor Frederick of Germany, our confrère Dr. Thos. W. Evans, the Emperor's dentist, states that the cause of the affection which

resulted fatally was a diseased wisdom tooth.

It is of great importance that an early diagnosis be made of any little irritation or slightly ulcerated surface in the mouth, so that its nature may be ascertained as soon as possible, and the exciting cause removed.

The dental surgeon, whose speciality necessitates the frequent examination of the mouth, should, if skilled, be able to detect the first signs of malignant disease.

Prompt action in most cases saves the patient's life without the necessity of a serious surgical operation.

CHAPTER V.

POISONING BY DISEASED TEETH AND GUMS.

THE deleterious effects of diseased teeth and suppurating gums upon the general health are at first so insidious that usually not even a thought is given to the possible connection between the patient's lowered vitality, evidenced perhaps only by some diminution of appetite, slight indigestion, irritability, or insomnia, and dental disease.

It is commonly believed that if teeth and roots give no pain they are doing no harm. This, however, is quite a mistake, for it is teeth and roots which have long been dead, and therefore unable to ache, that become purulent and are the cause of this form of chronic poisoning. If the absorption of purulent matter is permitted to continue the

patient's appetite will gradually be lost, and his digestion ultimately so deranged that the little food he takes will give rise to nausea, discomfort, and pain. The subtle effect produced on his nervous system will be evidenced by mental lassitude, depression, loss of energy, and inability to perform his daily work. There is, in fact, a general lowering of vitality, and the patient seems "under a cloud." In severe cases his appearance may closely resemble that of those suffering from malignant disease, owing to the sallowness of his complexion and the loss of weight resulting from malnutrition.

The possibility of many of the simpler ailments being due to oral sepsis, i.e., an unhealthy condition of the mouth, should always be kept in mind by both doctor and patient.

Next to diseased teeth, suppurating gums (Rigg's Disease) are the commonest cause of chronic poisoning. In these cases the cause of the mischief is often not even suspected until late in the course of the

disease, when pus is discharged from the gum around one or more teeth.

Another common cause of chronic poisoning is a dental abscess opening on the gum opposite the end of the root of the affected tooth.

The constant swallowing or absorption of even minute quantities of purulent matter is able to produce an amount of bodily and mental suffering and injury which appears wholly incommensurate with its inconsiderable origin.

Notes of Cases.

1. This gentleman had been in ill-health for ten years before consulting us. His appearance clearly indicated that he was suffering from some form of chronic poisoning. His symptoms were so severe that the diagnostic skill of some of our best surgeons had been baffled. Careful investigation from what may be termed a dentist's standpoint, however, disclosed the cause of the mischief—an abscess beneath

an unerupted wisdom tooth, i.e., a wisdom tooth which had remained buried in the jaw. The condition readily yielded to treatment, and his health was soon restored.

2. This lady had been treated by several prominent physicians for a disease of the throat, associated with general debility, without benefit. A diseased lower molar was found to be the exciting cause of the trouble. After its treatment her health rapidly improved under quite simple remedies, and her throat trouble entirely disappeared.

3. As an example of the surprisingly rapid recovery of persons suffering from chronic poisoning caused by diseased teeth and gums after appropriate treatment of the mouth, we will mention the following case.

A gentleman, aged sixty-four, had enjoyed the best of health until within four years of consulting us, during which time he had received medical attention, but without deriving any benefit. We found several

badly diseased teeth and roots. They were treated, and in ten days he had gained six pounds in weight, the improvement being steadily maintained. His rapid and complete restoration to health conclusively proved that the poison generated by the diseased condition of his teeth was the cause of his seriously disordered system.

CHAPTER VI.

DIET IN RELATION TO THE TEETH.

It is commonly thought that the teeth, once formed, remain what they are, either strong or weak, and are not subject to any further changes in structure; in fact, that they are like pieces of marble—formed and finished. Nothing, however, could be further from the truth. Teeth are as much integral parts of the living organism as bones, and require the same constant supply of lime-salts, especially phosphate of lime, to remain strong and healthy. We therefore recommend the addition of wholemeal bread (brown bread) and other cereals, which are rich in lime-salts, to the daily diet.

Though the amount of lime-salts present is the chief consideration in the selection

of tooth-forming food, it should also be remembered that hard work is of the first importance for the preservation of the teeth. Hard food should therefore, as far as possible, be preferred to soft.

We are often asked by the anxious parent: "Why do my children suffer so much with their teeth, when my grandparents used to say that they never had toothache, nor even consulted a dentist? Why is it that, in spite of all the care and attention which have been bestowed on both my teeth and their teeth—in a word, in spite of all that fifty years of progressive dentistry claims to have accomplished—these children's teeth show such pronounced signs of degeneration?"

We answer: "In some measure this is due to the present artificial mode of living and unsuitable diet, but to a much greater extent to improper methods of treatment and the disregard of aseptic precautions, such as the daily sterilization of the tooth-brush, &c."

Civilization always leads to an artificial mode of living. During the palmy days of Egypt, Greece, and Rome, when a high state of civilization, combined with wealth, induced luxury and indolence, it became necessary to make the treatment of the teeth a separate branch of medicine. The whole history of dentistry shows that whenever a high state of living is adopted the teeth become weaker and more liable to disease. Decay may, however, be prevented in even the weakest teeth by attention to common-sense hygiene, i.e., the sterilization of everything used in the mouth, suitable diet and mode of living, and the avoidance of improper dentistry and unsuitable preparations for cleansing the mouth and teeth.

A simple and healthy diet and mode of living conduce to the preservation of the teeth by improving their texture, thereby increasing their resistive power to infection. Plain food, fresh air, outdoor exercise, and wholesome amusement, with avoidance of

all dietary, physical, and mental excesses, will do much not only for the general health, but also for the preservation of the teeth.

Teeth in their present degenerate state vary much in texture and hardness. A perfect tooth is composed of over 70 per cent. of lime-salts, chiefly phosphate of lime. If we examine the enamel separately we find that nine-tenths of it is phosphate of lime. This, then, is the essential ingredient needed by the system for making and preserving a sound tooth.

The potter cannot make his vessels without clay, nor can the animal system build up the tissues of the body without proper material.

When the teeth are weak and chalky, lime-salts should be supplied in liberal quantity. In certain cereals we find the necessary elements for this purpose. Wheat stands first in the list, oats next. In the manufacture of ordinary white flour the most important bone-producer is removed, viz., the outside part of the grain, in order

to yield a whiter commodity. The daily use of wholemeal (brown) bread and other cereals* from the age of twelve months till middle life will supply the materials for the natural growth and wear and tear of the teeth.

A point of considerable importance for the proper development of the teeth of a child is the quality of the food supplied to the mother during the period of gestation and nursing. If it does not contain sufficient lime-salts the teeth of her offspring will suffer, and the great drain upon her constitution to supply the wants of the child will have a detrimental effect upon her own teeth; hence the remark so often heard, "For every child I have lost a tooth."

Rationalism in Medicine.

Natural methods of treating disease, viz., appropriate diet, simpler mode of life,

* American breakfast cereals supplied by the American Cereal Company, 11, Finsbury Square, E.C., abound in mineral phosphates, and will be found excellent food for children and adults.

physical exercise, &c., are now considered by the leaders of medical thought and practice to be of infinitely more value than the use of drugs.

Diet versus Drugs in the Treatment of Disease.

The effects of different foods on disease have been very carefully studied, and much care is now given to the selection of a suitable diet in the treatment of all diseased conditions. Thus, food containing sugar or starch is little less than poison to the diabetic; albumen should be excluded from the diet of the cancer patient, as malignant growths consist largely of albumen, and the withdrawal of the special nutriment upon which their growth depends tends to their absorption; foods rich in phosphates should be given to brain-workers, as phosphorus is a very important constituent of the brain; and a tendency to decay of the teeth should be combated in the same way, by supplying phosphates of lime.

There is, in fact, hardly any limit to the curative possibilities of food.

CHAPTER VII.

ELECTRICITY IN DENTISTRY.

The Mitigation of Pain by Modern Electrical Appliances.

THE recent application of electricity to dentistry has revolutionized the methods of treatment and greatly mitigated the discomfort of dental operations. The crude and cruel methods usually associated with the dentist's chair are now happily things of the past.

Electricity has been utilized as a motive power in the construction of an accurate and swift dental drill, possessing many great advantages over the ordinary foot instrument.

This electric motor-drill does away with the vibration and friction which are necessarily caused by the foot instrument, and

to which much of the pain and natural dread of dentistry heretofore was due. It also leaves the operator free from physical exertion to give his whole attention to the direction of the instrument—time, pain, and trouble being all saved by this ingenious machine.

Special instruments have also been devised for rapidly and painlessly bleaching discoloured teeth, deadening and disinfecting teeth and roots before filling, inserting gold fillings silently, illuminating the mouth during operations, and transilluminating — i.e., seeing through — the jaws and teeth. A short description of the last may perhaps be of interest.

Transillumination of the Mouth.

The transilluminator which Dr. Wedgwood has recently perfected depends upon very powerful electric light, not Röntgen rays. By its use a hidden cavity of decay, an unsuspected dead nerve, an incipient abscess, a broken fragment of a tooth, or

enlargement of a root, shows as plainly as a spot on a window-pane, and any diseased condition of the bone can be immediately diagnosed. The whereabouts of teeth that



FIG. 4.

Transillumination of a child's mouth, showing a retained temporary tooth (A) obstructing the eruption of a permanent tooth (B) and deviating it from its proper position.

are late in cutting can also be definitely ascertained.

The transilluminator is of incalculable value in diagnosis, as sound teeth are often needlessly sacrificed in fruitless endeavours

to find the origin of neuralgic pain, for which, owing to the ineffectiveness of the usual means of diagnosis, no satisfactory cause can be discovered.

Supplying Nerve Force (Electricity) by means of an Electric Base for Artificial Teeth.

As the efficacy and propriety of this apparently extraordinary adaptation of electricity to dentistry must seem all but incredible to the lay reader, we quote the opinion of independent expert authorities on Dr. Wedgwood's invention. The "Medical Gazette" says: "Dr. Wedgwood's recent invention we believe will prove a great boon to those suffering from nerve prostration by supplying nerve force (electricity) through the medium of an electric base for artificial teeth. By this base a gentle but continuous electric current is generated not perceptible to the senses, yet stimulating the nerves and tissues and producing a curative power over the whole system, and enabling those persons to wear

artificial substitutes with comfort who never could before. In the treatment of all diseases from neurasthenia (nerve debility) it will be a most valuable aid."

Wm. Lant Carpenter, Esq., B.A., B.Sc., writing in "Health," says: "An ingenious application of the continuous current to dental purposes has just been made by Dr. Wedgwood, who has contrived an arrangement, to be used either with or without artificial teeth, in which what is practically a minute battery, composed of pairs of two metals in very small plates, is worn inside the mouth. The saliva acts as the exciting fluid, and a weak continuous current, localized in the palate and gums, is thus set up."

The use of electric dentures has been attended in our practice with great benefit in many cases of neuralgia and neurasthenia.

The first appearance in London hospitals of a medical battery was in the year 1767, at the Middlesex Hospital.

The use of electricity in hysteria, headache, sleeplessness, noises in the ears, loss of smell, facial paralysis, neuralgia, tic-douloureux, wry-neck, and deafness has been beneficent.

Röntgen Rays.

Though amongst the pioneers of their application to dentistry, we do not advise their use, owing to our belief that the process is not entirely free from danger to both patient and operator.

Radium.

We cannot yet say anything definite respecting its uses in the mouth, as its applicability is still in the experimental stage.

CHAPTER VIII.

THE TEMPORARY, OR MILK TEETH.

TEETHING commences at about the sixth month of life, and is usually complete at the end of the second or the beginning of the third year. While this period is frequently associated with disturbance of health, many children pass through it with no worse symptoms than some irritation of the gums, slight fretfulness, and transient sleeplessness. Very serious complications may, however, result from neglect of the child's general health or of acute local symptoms, more deaths occurring during this stage than at any other period of life. Convulsions, inflammation of the auditory nerve leading to deafness, inflammation of the brain, respiratory and other disorders are unfortunately only too common. Rub-

bing the gum with a hard substance until the point of the tooth is exposed only increases the inflammation without accelerating the cutting of the tooth. Lancing the gum is not often necessary. Teething powders and mixtures are usually harmful, and should be avoided.

During teething the teeth should be gently brushed at least once a day, and the mouth rinsed out occasionally with a weak solution of bicarbonate of soda or lime-water. If a little be swallowed no harm will result.

The milk set consists of twenty teeth, ten in each jaw.

We are often asked if it is necessary to preserve and fill temporary teeth when decayed. We advise it in all cases for the following reasons:—

1. If decay be allowed to run its course the nerves of the teeth become exposed, giving rise to pain and tenderness; this prevents proper mastication, and thus the child's health is injured, its vitality lowered,

and its development arrested at a very critical time, the many resulting evils including imperfect formation of the permanent teeth, which have at this period already begun to develop in the jaws.

2. The natural process by which the roots of the milk teeth are absorbed prior to their replacement by their permanent successors is seriously interfered with by the death and decomposition of the nerves of the milk teeth, and the consequent formation of small abscesses or gum-boils. This is a common cause of irregularity and deformity of the permanent teeth.

Decay may begin very early in the milk teeth, and no pain is usually felt until serious damage has been done. We see then the importance of attention to the teeth very early in life, and, since so much is involved at this period, it is very necessary that the advice of a competent dental surgeon be taken. The trained eye can often foresee the tendency to decay, and the practitioner, by a little assistance, or it

may be by a timely suggestion, can often prevent the commencement of decay. If the disease be incipient the treatment is much more simple and certain in its results than if permitted to continue until actual pain notifies that the tooth is in danger. Seeing, then, that dentistry is a necessity, its benefits should be secured when it repays best and costs least.

CHAPTER IX.

IRREGULARITY AND CROWDING OF CHILDREN'S TEETH.

IRREGULARITY of the teeth is unfortunately very common, and calls for prompt attention and skill of the highest order, valuable teeth being frequently needlessly extracted, and even the whole set sometimes seriously injured by the wearing of improper plates and appliances.

A crowded or irregular condition is not only very unsightly, but also often greatly reduces the masticating power of the teeth. Pronounced irregularity may produce great deformity, sometimes entirely destroying the contour of the face, distorting the features, and giving an expression utterly at variance with the true character of the person. Crowded teeth are also more

liable to decay than those regularly placed, owing to particles of food being retained in their interstices, which are often inaccessible to the tooth-brush.

Most cases of irregularity can be corrected without the extraction of any of the teeth (a very common practice) and without any pain whatever, by means of expansion or contraction appliances, the abnormal condition being usually due to imperfect or excessive development of one of the jaws. Up to eighteen or nineteen all the bones of the body are imperfectly calcified and in a semi-plastic condition; it is therefore possible by means of gentle pressure to either expand or contract the jaws and move the teeth without pain or danger to the surrounding parts. The younger the patient, the quicker is the irregularity corrected.

We know of no more important operation in dental surgery than the correction of irregularities of the teeth, nor one which secures more important and lasting benefits to the patient.

Even the worst cases can now be corrected without pain or inconvenience of any kind, and nearly always without extraction or the use of plates. Nor are the benefits of this method restricted to the young, but the older the patient the longer the process.

When the child can only be seen at long intervals the wearing of a plate may be necessary.

In cases of irregularity and malformation, which are beyond correction by ordinary methods on account of age, unsightly shape, malposition, or poor type, new porcelain crowns ("pivots") can be adapted to the roots and placed in the correct line of the dental arch.

The Prevention of Irregularities of the Teeth.

If the following adverse influences and habits be corrected and avoided there is a very good chance that the child's second teeth will not be crowded or irregular:—

1. Hereditary tendencies, e.g., tubercle,

struma, rickets, &c., have much to answer for in the causation of irregularities of the teeth by interfering with the proper development of the jaws, and should be combated early. Sometimes the child inherits the large teeth of one parent and the small jaws of the other, much crowding resulting.

2. Nerve influence, caused by too much mental, and not enough physical, exercise during childhood, interferes with the development of the jaws, and is considered by Dr. Kingsley, an American authority, to be one of the chief causes of irregularity of the teeth.

3. The too early extraction and undue retention of the milk teeth are also causes of irregularity of the permanent ones.

4. Thumb, lip, tongue, finger, and toe sucking are common causes of irregularity.

5. Abscess ("gum-boil") of a temporary tooth, due to neglect of decay or unskilful filling, may lead to deformity and malposition of its successor.

6. Mouth-breathing, usually due to adenoids and enlarged tonsils, often leads to abnormality of the upper jaw, with consequent displacement of the teeth.

7. Improper diet is an important factor in the causation of irregularities of the teeth, the food of civilized man being much too soft for the normal development of the jaws and teeth.

**Diagrams from Cases in Practice Illustrating
Various Forms of Irregularity.**

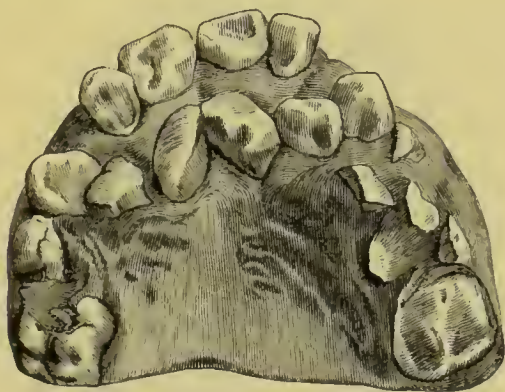


FIG. 5.

Fig. 5 is a model of the upper jaw of a child, nine years of age, whose temporary teeth had been unduly retained. The permanent teeth are seen in the palate, giving the appearance of a double row of teeth.



FIG. 6.

Fig. 6 is a model of the upper jaw of a child, twelve years of age, showing the eye-teeth outside the other teeth, a very common form of irregularity.

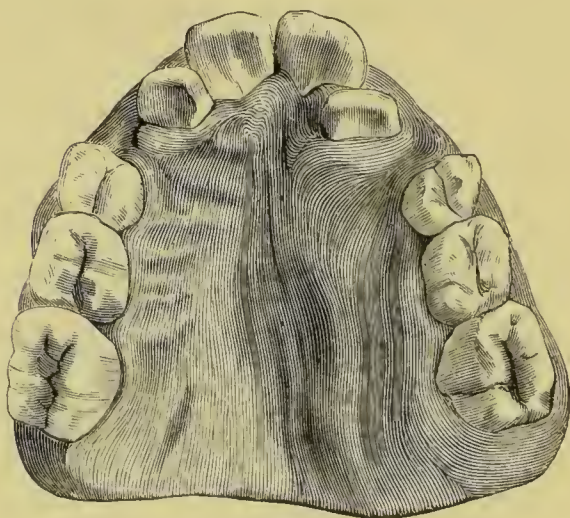


FIG. 7.

Fig. 7 is a model of the upper jaw of a child, nine years of age, showing a common form of displacement of the front teeth (incisors). This form of irregularity yields very quickly to treatment; the above case was corrected in a month.



FIG. 8.



FIG. 9.

Fig. 8 is the case of a child, aged fifteen years, showing protrusion of the upper front teeth ("open-bite"), a very unsightly form of irregularity.

Fig. 9 is the same mouth after treatment. This case was corrected by a contraction appliance.

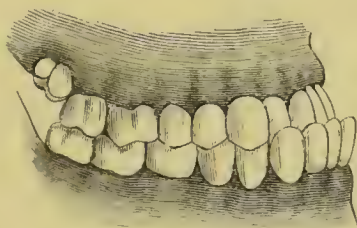


FIG. 10.

Fig. 10 is the case of a young man aged eighteen, showing a very unsightly form of irregularity ("underhung-bite"). The lower front teeth will be seen to close *in front of*, instead of *inside*, the upper ones. This case was corrected by an expansion appliance.

CHAPTER X.

THE PERMANENT TEETH.

THE cutting of the permanent teeth commences at about the seventh year, and is not complete until after the eruption of the wisdom teeth, which usually occurs between the seventeenth and twenty-fifth years.

The permanent set consists of thirty-two teeth (including the four wisdom teeth), sixteen in each jaw.

No pain or disturbance of health is occasioned by their eruption, except sometimes by the lower wisdom teeth.

Difficult eruption of the lower wisdom teeth may give rise to great pain, and should on no account be neglected, as acute inflammation of the throat and jaw, leading to total inability to open the mouth ("false lockjaw"), may result if the condition be

neglected. If promptly attended to, the inflammatory process can usually be aborted.

Sometimes the wisdom teeth do not cut until quite late in life, being then described as a third set, no authenticated case of which, however, has ever occurred, all popular legends to the contrary notwithstanding.

CHAPTER XI.

THE FORM AND STRUCTURE OF TEETH.

A TOOTH consists of a Crown—the part above the gum; a Neck—the part covered by the gum, but which becomes exposed and sometimes very sensitive when the gum recedes; and one or more Roots or Fangs, implanted in the bone of the jaw.

The crown is covered by a coating of very hard material—enamel; and the root by a thin layer of specialized bone—cementum.

The body of the tooth is composed of a modification of ivory (not bone) termed Dentine, and is hollow in the middle, the space being filled by the Pulp, or Nerve, as it is popularly termed.

The pulp is a soft, exquisitely sensitive



The lines represent diagrammatically the fine terminations of the nerve ramifying through the hard tissues of the tooth.

tissue containing not only nerves, but also arteries and veins, all of which enter through the end of each root, and are in direct communication with the general nervous and vascular systems.

Each root is implanted in a separate socket in the bone of the jaw, to which it is attached by a membrane termed the Perioosteum. When a tooth is tender to bite on it is due to inflammation of this membrane, caused by cold, gout, rheumatism, or debility.

CHAPTER XII.

THE FUNCTIONS AND RELATIONS OF THE MOUTH AND TEETH.

THE mouth is the entrance to the alimentary canal, and in part also to the respiratory tract, the nose being, however, the natural breathing channel.

It contains the teeth as well as other organs associated with the selection of food (taste, &c.) and its preparation for digestion—the tongue, cheeks, lips, palate, salivary glands, &c.

There is direct communication between the mouth and the nose, throat, lungs, and stomach.

The ears are in indirect communication with the mouth through the Eustachian tubes of the throat, and the eyes through the lachrymal ducts of the nose.

The glands of the neck may become infected by diseased teeth, usually the lower back teeth. Glands so affected often break down and become the starting-point of tubercular infection.

Through their nerves, arteries, and veins the teeth are in direct communication with the general nervous and vascular systems.

The importance of keeping the mouth and teeth in a perfectly healthy condition can therefore hardly be overstated.

If the teeth are decayed every mouthful of food taken is poisoned and much of the air inhaled impure; the digestion will in time become disturbed and the blood vitiated. Decayed teeth do not kill, yet just a little lowering of vitality may, in the battle of life, be sufficient to determine whether a person succeeds or fails.

CHAPTER XIII.

THE PRESERVATION OF THE TEETH BY STOPPING OR FILLING, PIVOTING, AND CROWNING.

THE extraction of teeth and roots, even the most extensively diseased, is now rarely necessary; even when abscessed they can usually be rendered healthy and useful. But, of course, hopelessly diseased teeth and roots must on no account be left to poison the breath and undermine the health of the patient.

Teeth well Filled are Saved.

The various processes adopted for the repair of decayed teeth being too technical to be of interest to the general reader, we will only say that in most cases we restore the lost part by means of a porcelain or

enamel filling of the same colour and translucency as the tooth.

Gold, amalgam, and other materials in general use we have nearly entirely discarded owing to their inferiority, not only in appearance, but also often in durability, to porcelain.



FIG. 12.

Represents a molar root prepared and painlessly cut off to the level of the gum.



FIG. 13.

Shows the pivot hermetically cemented to the root.

This method is applicable to any root.

If the tooth be too extensively diseased for effective filling in this way we fix a solid porcelain tooth, termed a Pivot, on the root; such a tooth is indistinguishable from a natural one (see Figs. 12 and 13).

At the back of the mouth a very much damaged tooth is sometimes best restored

by fitting a gold or platinum cap of the exact dimensions of the original tooth to the stump or roots; this is termed a Crown. Such crowns can be enamelled to the exact colour of the natural teeth.

By means of the elaborate electrical appliances now used by practitioners in the higher walks of dentistry the filling, pivoting, and crowning of the teeth can be performed with very little discomfort.

We have often heard the remark, "I should like to have my teeth attended to, but I am afraid it would be very painful." This groundless fear has deterred many from seeking advice early enough to obtain the maximum benefit of modern dental science. Persons having an examination made of their teeth twice a year, so that the first evidence of disease may be met and combated, rarely, if ever, suffer the least pain. A child's first visit to the dentist is usually anticipated with horror, therefore it should be of short duration, so as not to tax the patience of the little one. The

operator must be gentle, kind, and, above all, give no pain. It will suffice to insert a temporary filling for a few months; by this procedure the most nervous child will gain confidence, and will later be induced without difficulty to submit to longer operations when required. Our experience of children is that they make excellent patients; in fact, many of them are quite pleased to come to see us.

CHAPTER XIV.

TOOTHACHE.

THERE are two distinct types of toothache, exemplified by: (1) An *aching* tooth, and (2) a *sore* or *tender* tooth.

An **aching tooth** is nearly always extensively decayed, and the pain, which is caused by inflammation of the nerve, varies from a slight response to heat and cold or sweet and acid substances to most violent jumping or shooting pain all over the face and head, sometimes extending even to the shoulder and spine.

The commonest cause of this form of toothache is pressure of food on an exposed nerve. Other causes include pressure of a badly inserted filling, compression of the nerve by gouty or rheumatic thickening of

the root, and the presence of gouty deposits in the substance of the nerve itself.

A tooth should never be extracted on account of aching; the nerve can always be painlessly destroyed and the tooth subsequently filled.

A sore or tender tooth may be either decayed or quite sound. The tenderness is not due to irritation of the nerve, but to inflammation of the membrane uniting the root of the tooth to the jaw. Strange as it may seem, it is nearly always a dead tooth, i.e., a tooth in which the nerve has died or been removed, that becomes inflamed in this way, a slight chill being usually the exciting cause.

A tooth so affected is tender to pressure, and feels longer than the rest of the teeth owing to the inflamed root-membrane swelling up and pushing the tooth bodily out of its socket. The pain is of a dull, gnawing character, not very localized, but sometimes severe. Should throbbing supervene, it is a sign that an abscess is forming, a fairly

frequent result if the condition be neglected. Prompt treatment at the outset aborts the inflammation and averts an abscess.

Dental Abscess.

When an abscess forms it is situated between the root of the tooth and the bone of the jaw. It gives rise to severe throbbing pain, which continues until the matter has burrowed through the bone and escaped into the soft tissues of the gum or cheek, when considerable swelling of the face occurs. The pain becomes less agonizing as the face swells, but may remain severe until the matter is discharged.

The abscess usually opens on the gum, opposite the end of the root of the affected tooth, the opening being termed a "gum-boil." Sometimes, however, the matter discharges through the cheek, chin, or at some point even more remote, leaving very ugly permanent scars.

Neighbouring glands, especially those of the neck, may also become infected.

CHAPTER XV.

THE NERVOUS RELATIONS OF THE TEETH.

THE nerves may be compared to a telephone system, the brain corresponding to the exchange and the nerves to the many lines converging to it. A message sent from the end of one line will be heard at the end of another line, often far distant; so with the nerves, irritation of the end of one nerve may set up pain in quite a different region of the body. This is termed reflex pain, or sympathy, and though of neuralgic type is not true neuralgia, which is an actual inflammation of a nerve.

When caused by diseased teeth reflex or sympathetic pain may be felt in the eye, ear, temple, or any part of the face or head, and

sometimes in the shoulder and down the spine, or even in internal organs, viz., the stomach and intestines. Such cases are immediately cured by appropriate treatment of the offending tooth or teeth.

Pain caused by a diseased tooth is often felt in another tooth, sometimes in quite a different part of the mouth; thus sound teeth are often extracted in error.

Twelve pairs of nerves originate in the brain, termed "cranial nerves," and thirty-one in the spinal column.

The fifth is the largest of the cranial nerves, and it is irritation of this nerve which is responsible for all the miseries of toothache, facial neuralgia, tic-douloureux, and sympathetic affections of the eye and ear, as well as of convulsions in children during teething. This nerve is termed the "tri-facial nerve," owing to the fact that it divides just in front of the ear into three branches, the first supplying eye, eyelid, forehead, and scalp; the second, the upper jaw and teeth, face, nose, and upper lip;

and the third, the lower jaw and teeth, tongue, ear, chin, and lower lip.

The remote effects and sympathetic disturbances which may result from the irritation of the nerve of a tooth can be readily understood when it is remembered that these different organs—teeth, nose, eye, ear, &c.—are in direct communication with each other, being all supplied by branches of the same nerve (see Fig. 14).

The teeth should be suspected in all cases of obscure pain in the head, face, eye, nose, and ear. And it should also be remembered that sensations of pain produced by irritation of a branch of this nerve in the mouth, e.g., in a tooth, may be referred to distant organs, viz., the stomach and intestines.

A tooth is a living integral part of the human body, nourished by the same food, vitalized by the same blood, and pervaded by the same nerves as the heart, the lungs, and the brain. To look upon the teeth as mere mechanical organs, needing only

mechanical treatment, is therefore to ignore their obvious relations to the whole organism.

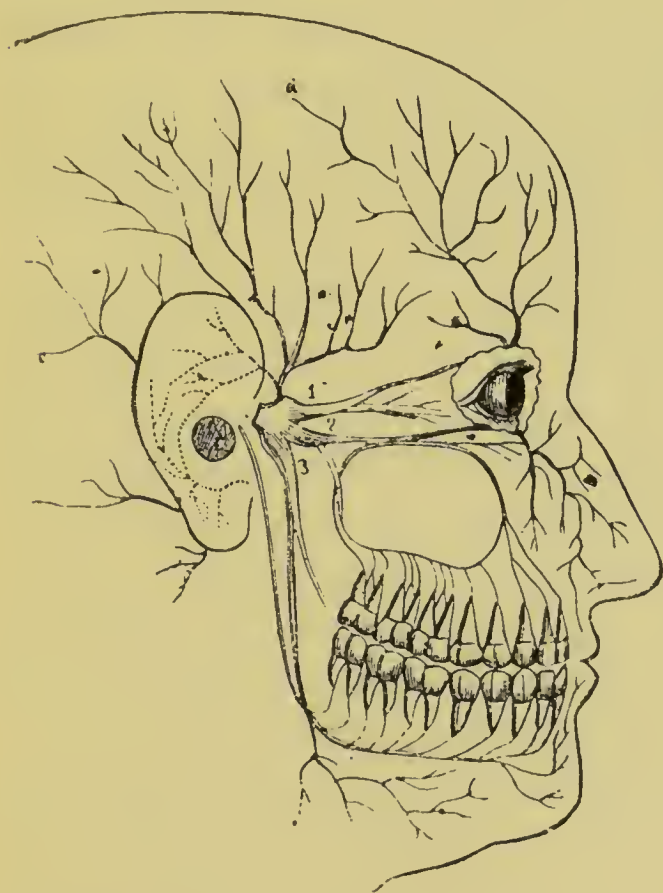


FIG. 14.

Diagram of the distribution of the fifth cranial nerve.

The authors have on several occasions succeeded in restoring sight in cases of amaurosis (loss of vision) by appropriate treatment of the teeth.

Cure of paralysis of the left side has also occurred in our practice. The patient stated that the paralysis came on after an attack of acute pain in a tooth. This tooth was extracted; the paralysis was cured and has not returned.

An instance is cited by Professor Velpeau, of Paris, of mental derangement in a lady which was cured by simply lancing the gum, liberating a wisdom tooth.

Dr. Sexton, of New York, states that he has found decayed teeth responsible for deep-seated cerebral trouble in children, "progressive dementia (insanity) having been arrested by repairs on the teeth."

Pages could be filled with similar cases; but enough has been said to show that toothache, excruciating as are its agonies, is but one of the minor evils resulting from diseased teeth.

Facial Neuralgia.

Paroxysms of acute pain occurring once or twice a day at about the same hour each day serve to distinguish true neuralgia from ordinary toothache.

The commonest cause of the malady is debility, the anæmic, malarial, neurotic, gouty, or rheumatic subject being especially susceptible to it.

Very slight causes are sufficient to set up the disease in those predisposed to it, the commonest being a diseased tooth. Neuralgia above the eye is termed "tic-douloureux."

Many cases of neuralgia which have come under our notice had their unsuspected origin in the dental organs. We quote the following case:—

A lady, aged sixty, had suffered from neuralgia for ten years, during which time she had been twice operated on without benefit. On examination by transillumination we found enlargement of the root of a tooth causing pressure on the nerve at

its point of entry. The removal of the tooth resulted in a complete cure.

Supplying nerve force (electricity) by means of an electric base for artificial teeth has been attended with much benefit in neuralgia and neurasthenia (see page 50).

The Influence of Study and Mental Strain on the Teeth.

We have noticed that the teeth suffer much more during the school and college periods, especially during cramming for examinations, than at any other time, the reason being that the phosphates required for the nourishment of the teeth are greedily seized by the over-stimulated brain, phosphorus being of special importance to that organ, particularly when it is overworked. The excess of phosphorus which it then consumes can only be gained at the expense of those organs which require this substance for their development and upkeep, viz., the bones and the teeth.

This question is not new. It has been

studied in France by Dr. Lucas-Championnière. This eminent physician advises all young people who go in for competitive examinations or a university career to exercise the greatest watchfulness over their teeth.

The Influence of Diseased Teeth on Disposition and Temper.

The state of the teeth not only affects the bodily health, but also influences character. In one of his tales Voltaire makes Dr. Sidrac say that people with sluggish livers are capable of the greatest crimes. This is perhaps going a little too far, but it must be conceded that such a condition strongly predisposes to hypochondria. In like manner diseased teeth, by setting up an insidious form of chronic poisoning, end by rendering the sufferer morose, irritable, and despondent.

CHAPTER XVI.

TARTAR.

TARTAR, or Salivary Calculus, as it is technically termed, is a deposit of lime-salts derived from the saliva.

Even the most careful brushing does not prevent its collection, and its neglect leads to recession of the gum and ultimately to loosening of the teeth; it is therefore advisable to have it removed at least twice a year.

In the gouty or rheumatic subject it is usually present in large quantity, and as it is rapidly redeposited, its removal three or four times a year may be necessary in these cases.

Tartar varies in colour and density from soft incrustations of a yellowish-white colour to brownish-black deposits of stony

hardness. In children a green variety is often present on the front teeth.

The most harmful variety of all is that which forms under the gum; it is invisible, the only early symptoms being bleeding of the gum when the teeth are brushed. This form often ends in ulceration of the gum, a condition termed "Rigg's Disease."

Almost as many teeth are lost through the ravages of tartar as by decay. Tartar may also cause ulceration of the tongue, cheek, or lip.

Recession of the Gum and Loosening of the Teeth.

If not periodically removed, tartar insidiously undermines the teeth, year by year forcing its way further under the gum until at last the tooth loses its connection with the jaw and drops out.

If removed early little harm has usually been done, but if allowed to collect until the teeth have become loosened much difficulty may be experienced in tightening them.

CHAPTER XVII.

THE EXTRACTION OF TEETH.

No tooth or root which can be restored to a healthy state should be extracted.

Methods have now been devised and perfected to save even the most diseased teeth and roots, and extraction has in consequence become one of the rarest operations in dentistry.

When, however, from long-continued neglect or constitutional causes—e.g., gout, rheumatism, &c.—the teeth have become hopelessly diseased or loosened, their removal can be effected without pain or risk.

Painless Methods of Extraction.

Many methods are employed. The most popular to-day is by injection into the gum of cocaine, eucaine, novocaine, &c. We, however, entirely disapprove of this method on medical grounds. The first considera-

tion in the rendering of extraction painless should be the absolute safety of the method employed, and the practice of injecting these dangerous and doubtful drugs, even in very small quantities, cannot, we think, be too emphatically condemned.

The next commonest method is by freezing the gum; the actual extraction is usually painless, but there is sometimes much after-pain.

Laughing gas inhaled through the mouth is also a popular method. It is quite safe, but the period of insensibility—about half a minute—is too short for careful operating.

The method we advise is the inhalation of laughing gas and oxygen through the nose. It is pleasanter than inhalation through the mouth in the usual way, and it has the following great advantages over the ordinary method: (1) its administration can be continued throughout the operation—for several minutes if necessary; and (2) the introduction of oxygen stimulates the action of the heart.

This method is preferred by many of the leading medical authorities of the day to all others.

Sterilization of Instruments.

All instruments used, not only for extraction, but in all dental operations, should be sterilized to avoid blood-poisoning and the conveyance of disease.

In this matter of aseptic methods, i.e., sterilization, &c., dentistry must keep pace with surgery. What Lister and Pasteur have accomplished for surgery—and no words can adequately describe the benefits which have been conferred on humanity by aseptic surgery—the introduction of these methods will unquestionably do for dentistry.

Everything used in the mouth, not only by the dentist—instruments, napkins, &c.—but also by the patient—tooth-brush, artificial teeth, &c.—must be sterilized. Until this is done the teeth will continue rapidly to degenerate.

CHAPTER XVIII.

REPLANTATION, TRANSPLANTATION, AND IMPLANTATION OF TEETH.

A TOOTH which defies ordinary treatment can be extracted, cleansed, filled, and replaced. This is termed "Replantation."

If it be too diseased for successful replacement, another person's sound tooth can be substituted for it. This is termed "Transplantation."

The process can be carried a step further ; thus, when the natural teeth are missing, artificial sockets can be drilled in the jaws and another person's sound teeth inserted. This is termed "Implantation."

We cannot advise the adoption of these methods, as the results are not always satisfactory.

Dr. Younger, of San Francisco, originated these operations, which can be performed quite painlessly under gas.

CHAPTER XIX.

CLEFT-PALATE AND OTHER ORAL DEFORMITIES.

THE teeth are not the only structures that the dental specialist may be called upon to replace. The construction of appliances for the relief of cleft-palate, or perforations of the hard palate, and for the restoration of parts of the jaws or face (nose, &c.) lost by disease or accident, or removed by operation, comes within his province.

In cleft-palate, more or less extensive restoration of the roof of the mouth is usually necessary.

Cleft-palate is a congenital condition due to non-union of the two sides of the upper jaw during development, and is usually associated with hare-lip. It may be cor-

rected either by a surgical operation or by wearing a specially constructed plate, termed an Obturator. If the condition be left untreated, swallowing, taste, smell, hearing, and speech are seriously interfered with, and the mortality of infants so affected is high.

Obtulators.

The construction of these plates requires not only an accurate knowledge of the anatomy and functions of the surrounding parts, but also special experience in this branch of dental art. With sufficient ingenuity and skill comfortable and effective appliances can be made for even the worst cases.

CHAPTER XX.

ANTRAL ABSCESS AND AFFECTIONS OF THE NOSE DUE TO DISEASED TEETH.

THE upper jaw consists of two bones, separated in their upper part by the nasal passages. These bones are hollow, the internal chambers, termed "antra," opening into the nose. As the roots of the side and back teeth often penetrate these chambers, purulent matter from a dental abscess or a diseased tooth may find its way into them, setting up a suppurative catarrh, or "Antral Abscess," as it is popularly termed. The matter accumulates within the antrum until it has filled it, and then escapes through the normal opening which exists between each antrum and the nasal passage of the same side into the nose.

An occasional slight discharge from one nostril, a sickly taste or bad smell in the mouth on rising, and perhaps some neuralgic pain over the eye, are usually the only symptoms. Pain is often entirely absent in antral disease.

If not diagnosed and treated, the disease insidiously destroys the bone and neighbouring structures, sometimes also setting up polypi of the nose and other troubles, which are often treated and removed without any benefit, symptoms in both medicine and surgery being only too frequently mistaken for the disease itself.

In addition to a purulent nasal discharge and polypi resulting from antral abscess, obstruction and inflammation of the nose may be set up by a tooth cutting upwards into it instead of downwards into the mouth, or by a dental abscess, in connection with one of the upper front teeth, bursting into it.

Neuralgic pain of dental origin may be felt sympathetically in the nose.

CHAPTER XXI.

THE MOUTH AND TEETH IN RELATION TO EATING, SPEAKING, HEARING, AND BREATHING.

Eating.

Food, to be beneficial, must first be slowly ground up by the teeth, thoroughly moistened and mixed with saliva, and rolled by the tongue into a mass of suitable size for swallowing.

The saliva contains a natural ferment, termed ptyalin, which begins the conversion of the insoluble starchy constituents of the food into soluble and easily digestible substances (sugars). Thus the first process of digestion is performed in the mouth provided that the food be reduced to sufficiently small pieces and time be allowed

for the saliva to become thoroughly incorporated with it.

If mastication be improperly performed, on account of the loss of the natural teeth or the ineffectiveness of the artificial ones worn, the digestive organs are called upon to do double work; they may be strong and stand it for a time, but sooner or later they are sure to rebel, and indigestion, at the very least, will be the result.

Food introduced into the stomach in an imperfectly masticated state may remain undissolved for days. The warmth and moisture of the body produce fermentation and putrefaction, generating gases and acids, which, if not soon ejected, cause irritation of the intestines, leading to headache, neuralgia, dyspepsia, heartburn, dysentery, and many other disorders.

To proper and prompt attention to the natural teeth, or, when they are lost, to their replacement by effective artificial ones, many cases of longevity can clearly be traced.

The stomach is the great chemical laboratory of the body. For the proper performance of its functions it must be in a healthy condition. Very slight causes are, however, sufficient to derange its functions; thus its activity may be seriously impaired, and the whole system in consequence thrown into disorder by nervous dyspepsia set up sympathetically by the inflamed nerve of a single tooth, or as the result of poisoning by matter discharges by suppurating teeth and gums, or even by saliva infected by decayed teeth.

Once the digestive organs cease to do their duty, enfeeblement of the whole body ensues, with attendant wasting and loss of vital power.

Dr. J. Marion Sims, the eminent American physician, says: "Decayed teeth are the means of producing more nervous disorders and more terrible consequences to the general health than almost any other cause."

The effects of serious disorder of the

digestive organs are sometimes so severe that the case may pardonably be mistaken, even by an experienced physician, for one of malignant disease.

Speech.

The clear articulation of words depends on the presence of teeth, the first lisplings of infancy and the imperfect enunciation of old age being due to the absence of these organs.

They also form a reservoir for keeping up a sufficient supply of air, for, if lost, continued speaking is found difficult from the fact that the mouth quickly empties of air, and abnormally rapid breathing is necessary to keep up the supply; this may end by setting up chronic cough and other throat and lung troubles.

From the æsthetic point of view also the teeth are of momentous consideration, the appearance of the mouth being a prime factor in beauty.

Hearing.

Earache is often caused by a decayed or abscessed tooth or root, usually the lower wisdom tooth.

Almost any form of dental disease—e.g., an exposed nerve, gouty or other enlargement of the root, inflammation of the lining membrane of the root, &c.—may result in ear trouble, and, if neglected, lead to deafness.

Our friend Dr. Samuel Sexton, of New York, who has been engaged in the investigation of the teeth of school children, finds that decayed teeth are very commonly associated with near-sightedness and impaired hearing.

It has long been known that marked sympathy exists between the ear and the teeth. Dr. E. Woakes, in his work on deafness, &c., corroborates this.

Breathing.

Though the natural and proper breathing channel is through the nose, much of the

air we breathe is inhaled through the mouth.

Mouth-breathing is responsible for much throat and lung trouble owing to the air reaching the lungs at too low a temperature and in a dry and impure state.

The best respirator is a closed mouth and a good set of teeth.

In twenty-four hours we breathe twenty thousand times. It can therefore be readily understood that contamination of the breath by decayed teeth, suppurating gums, and other diseased or unhealthy conditions of the mouth affects the delicate tissue of the lungs very adversely. It may even become the predisposing cause of consumption. The continued inhaling of poisonous matter also vitiates the blood, leading slowly but surely to ill-health.

CHAPTER XXII.

THE EVOLUTION OF DENTISTRY.

ALTHOUGH the origin of dentistry can be traced back to very remote times, it is only within the last few years that its methods have been systematized and reduced to an exact science.

Medicine was practised among the Aryans 2000 years before Christ (Lebon).

We find diseases of the teeth and gums mentioned in the Papyrus of Ebers, a compendium of ancient Egyptian science begun about 3700 B.C. and terminating 1550 B.C. There are no fewer than forty recipes in it for the cure of various dental diseases.

Herodotus, who wrote about 450 B.C., tells us that in his time many of the doctors in Egypt specialized as oculists, aurists, dentists, &c. From this it is clear

that as early as the fifth century before Christ dentistry was practised in Egypt as a true speciality of medicine.

Artificial teeth of Etruscan and Phœnician make, dating back quite 2500 years, have been found.

Only a little more than a hundred years ago, however, there was but one dentist in America, Mr. Woofendale, and he had to relinquish practice owing to lack of work. In 1840 the first college of dentistry was founded in Baltimore, U.S.A., with a class of two.

Dentistry as a Specialism of Medicine.

The human body is not a machine in the sense that one organ can be removed after another, cleaned, repaired, replaced, and the whole set to work again. No man should undertake to treat one region without first becoming acquainted with the structure, functions, and abnormal conditions of the whole body, symptoms of disease being so varied and often so remote

from the original cause. A true specialist is a practitioner who, after qualifying in the ordinary way, has pursued higher studies and devoted many years on the staffs of special hospitals to the treatment of one particular region of the body. The highly-trained dental expert of to-day is a medical specialist in the fullest sense of the word.

In the higher walks of dentistry in the United States there is now specialism within the speciality, some of the most expert operators confining their attention to a single branch of dentistry — e.g., extraction, filling, crown work, regulation of children's teeth, artificial teeth, &c.

It is the results of these eminent men's work as well as our own researches that have been described in the foregoing pages.

CHAPTER XXIII.

DENTAL REQUIREMENTS FOR CANDIDATES ENTERING THE ARMY AND NAVY.

Information supplied to us by the War Office and the Medical Department of the Navy, May, 1909.

ARMY.

“The candidate’s teeth to be in good order; loss or decay of ten teeth will be considered a disqualification.

“Decayed teeth, if well filled, will be considered as sound.

“Artificial teeth not recognized.”

NAVY.

(a) “Five teeth defective or deficient in persons under seventeen years of age on the day of entry—ten defective or deficient

teeth in persons above the age of seventeen will disqualify.

(b) "Both classes of persons must, however, possess at least four perfectly sound opposing molars, viz., two in each jaw, and the same number of incisors similarly placed.

(c) "A tooth is to be considered defective when it cannot be made permanently serviceable by dental repair.

(d) "In all cases due regard is to be paid to the condition of the remaining teeth, and their being likely to last for at least twelve years. Credit is to be given for teeth which have not erupted, unerupted wisdom teeth excepted.

(e) "Artificial teeth are not recognized."

All candidates should have their teeth skilfully attended to before presenting themselves for their medical examination.

Army and Navy Dentists.

Though we long urged the necessity for Army and Navy dentists without avail, the

importance of this matter has been recognized since the last edition of this little book was published, and dentists have now been appointed to both.

Dr. Wedgwood held a commission as surgeon in the United States Army, and can testify to the usefulness of a dental practitioner on the field of battle, as he is able to make special splints for fractures of the jaws, and other appliances to relieve the wounded and obviate future deformity.

The "British Journal of Dental Science" says: "When the Americans started operations in their war with Spain, so many of their men were incapacitated through toothache that it was found necessary to appoint dentists to the troops in the field. In the Soudan campaign the same inconvenience was encountered, and had to be resolved by the employment of dental services.

"In the Chitral campaign the men's teeth were neglected, consequently many men were quite unfitted for service through toothache.

“Nothing should be considered too unimportant to secure the comfort of our soldiers, who are risking their lives for their country, and in addition have an enormous amount of discomfort to put up with without the agony of toothache.”

CHAPTER XXIV.

SUMMARY.

DEGENERATION OF THE TEETH: ITS CAUSE AND CURE.

It is very unsatisfactory to find that after fifty years of progressive dentistry the teeth are of infinitely poorer type than before the introduction of the tooth-brush and the advent of modern dentistry.

In the following pages we refute the universally accepted explanation that the present degeneration of the teeth is entirely due to the artificial diet and mode of living which civilized man has adopted, and is therefore unavoidable. Our grandparents were not savages, yet they possessed excellent teeth.

We will show that decay of the teeth is preventable—by due regard to common-

sense hygiene, which includes *the daily sterilization by boiling* of everything used in the mouth, viz., tooth-brushes, artificial teeth, &c.

The study of comparative hygiene reveals the remarkable fact that the method employed by savages for the care of their teeth, viz., the daily use of a freshly-cut stick or cane (never used a second time), is scientifically sound, whereas civilized man's use of an unsterilized tooth-brush, which is nothing less than an ideal incubator of germs, is about as unclean and unhealthy a habit as can be imagined. As ordinarily used the tooth-brush is most harmful to the teeth, except the very strongest, which are able to resist all adverse influences. In fact, our investigations show that the present all but universal prevalence of decay may largely be traced to its use, or, rather, to its improper use. For though it is an excellent agent for removing particles of food from between the teeth, it is also unfortunately laden with

germs, and each time it is used, unless it be effectively sterilized, it reinfects the mouth and teeth. For the development of bacteria the following factors are necessary—particles of food, warmth, moisture, and air. All these are present in the tooth-brush.

Sterilization of the Tooth-brush.

Immersing the brush in an ordinary antiseptic mouth-wash is quite useless. *A tooth-brush can only be effectively sterilized by boiling for ten minutes.* By having two or three in use, one will always be dry.

That the rôle which the tooth-brush is playing in the infection and destruction of the teeth should have remained so long unsuspected is well-nigh astounding.

During the many years that we have been engaged in the practice of dentistry, including extensive hospital experience, it has always seemed strange to us that the best sets of teeth are not found amongst

those who pay most attention to the cleanliness of their mouths.

Others have noticed this, but, not suspecting the real cause of the mischief, have advised the discontinuance of the use of the tooth-brush. It is, however, by far the best agent for cleansing the teeth, and when sterilized its use will be attended with benefit to both the teeth and the gums.

Dr. Harry Campbell, M.D., F.R.C.P., Physician to the North-West London Hospital, writing in the "British Journal of Dental Science," says: "Certain it is that some of the best sets of teeth I have encountered have been wholly unacquainted with the tooth-brush."

The paradox remained unexplained until Mr. Lavan's recent investigations and experiments revealed the true cause of the present degeneration of the teeth, viz., septic infection by unsterilized tooth-brushes and artificial dentures (plates), the deterioration becoming accentuated in each succeeding generation by heredity.

Sterilizer for Tooth-brushes, &c.

Though boiling ordinary tooth-brushes in any vessel is all that is required to render them aseptic, i.e., germ-free, we have devised a sterilizer and special tooth-brushes, which will withstand the necessary heat, as frequent boiling damages ordinary tooth-brushes. They can be obtained through any chemist or direct from Messrs. Keene and Ashwell, 6, South Molton Street, W.

Sterilization of Artificial Teeth.

Artificial teeth should be so constructed that their *sterilization by boiling* is possible, as cleansing in the ordinary way, no matter what care be taken, leaves them septic and infective not only to the remaining natural teeth, which generally become undermined and destroyed in consequence, but also to the throat, lungs, stomach, &c., often ending by setting up a very insidious form of chronic poisoning which, though hardly perceptible to the wearer, is yet sufficient to lower his vitality and increase his sus-

ceptibility to any disease to which he may be exposed.

Plates as ordinarily made cannot be sterilized, as boiling would irremediably damage them. The only cases in which it is difficult to construct sterilizable dentures are when all the teeth have been lost and vulcanite suction plates are worn. Though suction is most quickly and easily obtained by the use of vulcanite, we consider its replacement by a sterilizable material essential to health, even at the cost of some initial patience. The sterilizer mentioned above is so constructed that any kind of denture can be rendered aseptic, i.e., germ-free, in a few minutes.

After brushing, the tooth-brush and any artificial teeth worn should be sterilized.

In this matter of aseptic methods—i.e., sterilization, &c.—dentistry must keep pace with surgery. What Lister and Pasteur have accomplished for surgery—and no words can adequately describe the benefits which have been conferred on humanity

by aseptic surgery—the introduction of these methods will unquestionably do for dentistry.

Everything used in the mouth, not only by the dentist—instruments, napkins, &c.—but also by the patient—tooth-brush, artificial teeth, &c.—must be sterilized. Until this is done the teeth will continue rapidly to degenerate.

We are often asked by the anxious parent: “Why do my children suffer so much with their teeth when my grandparents used to say that they never had toothache, nor even consulted a dentist? Why is it that, in spite of all the care and attention which have been bestowed on both my teeth and their teeth—in a word, in spite of all that fifty years of progressive dentistry claims to have accomplished—these children’s teeth show such pronounced signs of degeneration?” We answer: “In some measure this is due to the present artificial mode of living and unsuitable diet, but to a much greater extent to improper methods

of treatment and the disregard of aseptic precautions, such as the daily sterilization of the tooth-brush.

Rules for the preservation of the teeth and the prevention of decay are given at pages 11-15.

Artificial Teeth.

Since our discovery of the necessity for sterilizing everything used in the mouth, we have devised a method of replacing lost teeth which is both hygienic and free from any risk of injury to the remaining natural teeth. As, however, this is quite a technical subject, all we will say here is that the process is painless if skilfully performed, and that such dentures are termed "Alveolar Saddles." They are made without any plate in the palate, all healthy roots and savable teeth being retained for their support.

This method is as far ahead of ordinary Bridge-work as Bridge-work is ahead of

old-fashioned artificial teeth on plates. It possesses the following advantages:—

1. The wearing of cumbersome plates is obviated.

2. Such dentures are easily removed by the wearer for cleansing and sterilizing.

3. There is no interference with freedom of movement of the tongue, enjoyment of taste, or distinct articulation (speech).

4. Each new tooth is placed over its own socket, so that each takes its own strain, following nature's plan—a point of great importance for both comfort and effective mastication.

Roots and decayed teeth, which could be made permanently useful and would be of the greatest value in supporting comfortable and effective artificial teeth, are unfortunately often heedlessly extracted, necessitating the wearing of plates.

Cancer of the Tongue due to Diseased Teeth and Ill-fitting Plates.

Cancer of the tongue is unfortunately only too common a result of neglect of the

teeth. Sir Morell Mackenzie says: "The determining cause of its appearance is in very many cases an injury, such as a blow, or the chafing of the tongue by a jagged tooth."

"While cancer rarely attacks the tongue before thirty, it is the commonest form of disease of that organ after forty."—"Lancet."

Sir Henry Morris, Bart., M.A., F.R.C.S., President of the Royal College of Surgeons, states that in no less than sixty per cent. of the cases of cancer of the tongue the disease begins on the edge of the organ, where it is exposed to the irritation of jagged and misplaced teeth, and that it is only when the affection begins in such places as the side of the throat, the inner surface of the jaw, or upon the floor of the mouth, all of which situations are rare, that the teeth can be altogether excluded as a possible exciting cause of the disease, and even then the origin of the malady is usually due to the irritation

produced by an ill-fitting plate made of cheap and impure materials.

It is of great importance that an early diagnosis be made of any little irritation or slightly ulcerated surface in the mouth, so that its nature may be ascertained as soon as possible, and the exciting cause removed. The dental surgeon, whose speciality necessitates the frequent examination of the mouth, should, if skilled, be able to detect the first signs of malignant disease. Prompt action in most cases saves the patient's life without the necessity of a serious surgical operation.

Poisoning by Diseased Teeth.

It is commonly believed that if teeth or roots give no pain they are doing no harm. This, however, is quite a mistake, for it is teeth and roots which have long been dead, and therefore unable to ache, that become purulent and are the cause of chronic poisoning.

The constant swallowing or absorption of

even minute quantities of purulent matter is able to produce an amount of bodily and mental suffering and injury which appears wholly incommensurate with its inconsiderable origin.

Diet in relation to the Teeth.

Teeth are as much integral parts of the living organism as bones, and require the same constant supply of lime-salts, especially phosphate of lime, to remain strong and healthy. We therefore recommend the addition of wholemeal bread (brown bread) and other cereals, which are rich in lime-salts, to the daily diet.

Though the amount of lime-salts present is the chief consideration in the selection of tooth-forming food, it should also be remembered that hard work is of the first importance for the preservation of the teeth. Hard food should therefore, as far as possible, be preferred to soft.

A simple and healthy diet and mode of living conduce to the preservation of the

teeth by improving their texture, thereby increasing their resistive power to infection.

Plain food, fresh air, outdoor exercise, and wholesome amusement, with avoidance of all dietary, physical, and mental excesses, will do much not only for the general health, but also the preservation of the teeth.

Rationalism in Medicine.

Natural methods of treating disease, viz., appropriate diet, simpler mode of life, physical exercise, &c., are now considered by the leaders of medical thought and practice to be of infinitely more value than the use of drugs.

Electricity in Dentistry.

The recent introduction of electricity has revolutionized the methods of treatment and greatly mitigated the discomfort of dental operations. The crude and cruel methods usually associated with the dentist's chair are now happily things of the past.

By means of the elaborate electrical appliances now used by practitioners in the

higher walks of dentistry, the filling and crowning of teeth can be performed with very little discomfort.

We have often heard the remark: "I should like to have my teeth attended to, but I am afraid it would be very painful." This groundless fear has deterred many from seeking advice early enough to obtain the maximum benefits of modern dental science.

Dr. Wedgwood has recently devised an apparatus for transilluminating, i.e., seeing through, the teeth and gums by means of powerful electric light, not Röntgen rays. This transilluminator is of incalculable value in diagnosis. By its aid a hidden cavity of decay, an unsuspected dead nerve, an incipient abscess, a broken fragment of a tooth, or enlargement of a root, shows as plainly as a spot on a window-pane, and any diseased condition of the bone can be immediately diagnosed. The whereabouts of teeth that are late in cutting can also be definitely ascertained.

The Temporary Teeth.

We are often asked if it is necessary to preserve and fill temporary teeth when decayed. We advise it in all cases for the following reasons:—

1. If decay be allowed to run its course the nerves of the teeth become exposed, giving rise to pain and tenderness; this prevents proper mastication, and thus the child's health is injured, its vitality lowered, and its development arrested at a very critical time, the many resulting evils including imperfect formation of the permanent teeth, which have at this period already begun to develop in the jaws.

2. The natural process by which the roots of the temporary teeth are absorbed prior to their replacement by their permanent successors is seriously interfered with by the death and decomposition of the nerves of the milk teeth and the consequent formation of small abscesses or gum-boils. This is a common cause of irregularity and deformity of the permanent teeth.

Irregularity and Crowding of Children's Teeth.

Irregularity of the teeth is unfortunately very common, and calls for prompt attention and skill of the highest order, valuable teeth being frequently needlessly extracted, and even the whole set sometimes seriously injured by the wearing of improper plates and appliances.

Most cases of irregularity can be corrected without the extraction of any of the teeth (a very common practice) and without any pain whatever, by means of expansion or contraction appliances, the abnormal condition being usually due to imperfect or excessive development of the jaws.

Crowding of the teeth should be corrected, as it increases their liability to decay.

The Filling and Crowning of Teeth.

Teeth well filled are saved.

For the filling or stopping of decayed teeth, as well as their restoration by

crowning when too defective to fill, we now use special enamels, which not only have all the hardness and durability of gold, amalgam, platinum, &c., but are absolutely undetectable, being of exactly the same shades and translucency as the natural teeth. It has taken many years to accomplish this, but the beauty of the results is an ample reward for all the time and labour devoted to the perfection of these enamel fillings and crowns.

Toothache.

A tooth should never be extracted on account of aching: the nerve can always be painlessly destroyed and the tooth subsequently filled.

The Teeth in relation to Sight.

The authors have on several occasions succeeded in restoring sight in cases of amaurosis (loss of vision) by appropriate treatment of the teeth.

The Teeth in relation to Eating.

The effects of serious disorder of the digestive organs are sometimes so severe that the case may pardonably be mistaken, even by an experienced physician, for one of malignant disease. If mastication be improperly performed, on account of the loss of the natural teeth or the ineffectiveness of the artificial ones worn, the digestive organs are called upon to do double work; they may be strong and stand it for a time, but sooner or later they are sure to rebel, and indigestion at the very least will be the result.

To proper and prompt attention to the natural teeth, or, when they are lost, to their replacement by effective artificial ones, many cases of longevity can clearly be traced.

Dr. J. Marion Sims, the eminent American physician, says: "Decayed teeth are the means of producing more nervous disorders and more terrible consequences to

the general health than almost any other cause."

The Teeth in relation to Speech.

The clear articulation of words (speech) depends on the presence of teeth, the first lisplings of infancy and the imperfect enunciation of old age being due to the absence of these organs.

The Teeth in relation to Breathing.

The best respirator is a closed mouth and a good set of teeth.

In twenty-four hours we breathe twenty thousand times. It can therefore readily be understood that contamination of the breath by decayed teeth, suppurating gums, or other diseased or unhealthy condition of the mouth affects the delicate tissue of the lungs very adversely. It may even become the predisposing cause of consumption. The continued inhaling of poisonous matter also vitiates the blood, leading slowly but surely to ill-health.

The Teeth in relation to Hearing.

Almost any form of dental disease—e.g., an exposed nerve, gouty or other enlargement of the root, inflammation of the lining membrane of the root, &c.—may result in ear trouble, and, if neglected, lead to deafness.

Tartar.

Almost as many teeth are lost through the ravages of tartar as by decay. Even the most careful brushing will not prevent its collection, and its neglect leads to recession of the gums and ultimately to the loss of the teeth; it is therefore advisable to have it removed at least twice a year.

The Painless Extraction of Teeth.

Many methods are employed. The most popular to-day is by injection into the gum of cocaine, eucaine, novocaine, &c. We however entirely disapprove of this method on medical grounds. The first consideration in the rendering of extraction painless

should be the absolute safety of the method employed, and the practice of injecting these dangerous and doubtful drugs, even in very small quantities, cannot, we think, be too emphatically condemned.

The method we advise for the painless extraction of teeth is the inhalation of laughing gas and oxygen through the nose. It is pleasanter than inhalation through the mouth in the usual way, and it has the following great advantages over the ordinary method of administration:—

1. Its administration can be continued throughout the operation—for several minutes if necessary.
2. The introduction of oxygen stimulates the action of the heart.

This method is preferred by many of the leading medical authorities of the day to all others.



LITERARY NOTICES

ON PREVIOUS EDITIONS OF

"THE PROGRESS OF DENTISTRY."

"The book, being in no sense characterized by technical phraseology, must appeal to a wide circle. All the sections are interesting, and a perusal of most of them must be of direct advantage. The chapters, for example, on the conservative treatment of the teeth and on cancer of the mouth arising from defective teeth are full of valuable information, while the record of what is being done by electricity in the domain of dentistry is useful reading. The authors are to be congratulated on the volume, whose popularity is shown by the fact that it has now reached its tenth edition."—*Morning Post*.

"The chapter on cancer arising from defective teeth should be read by everyone."—*London Observer*.

"Dr. Wedgwood has had great experience in the treatment of the dental organs, and his remarks, therefore, have special interest. Those who follow his instructions are likely to be saved many hours of pain, and much useless expense, trouble, and disfigurement."—*Court Journal*.

"Dr. Wedgwood, who is perhaps the most eminent American specialist we have in dentistry on this side of the Atlantic, has just issued a new edition of his book."—*New York Herald*.

"We unhesitatingly recommend this admirable little book, which can be readily understood by the non-professional reader, to whom it is particularly addressed."—*The Doctor*.

"The fact that it is now in its tenth edition shows that it meets a public want in regard to the important subject of which it treats. Dentistry is here dealt with from a popular standpoint, and the general application of the rules set forth by the authors would, there can be no doubt, be attended by general benefit, from infancy to

LITERARY NOTICES.

old age. Dr. Wedgwood, it may be added, has devoted over thirty years of his life to the study and practice of dentistry, and his name is associated with very valuable improvements in connection with the science of which he is a master."—*County Press*.

"This little work traces the history of dentistry from its earliest stage—500 B.C.—to the present day, and gives a concise and accurate description of all the scientific improvements which have so signalized the progress of this science during the last decade. We recommend it to all who desire health."—*Parisian*.

"Dr. Wedgwood's recent invention, we believe, will prove a great boon to those suffering from nerve prostration by supplying nerve force (electricity) through the medium of an electric base for artificial teeth. By this base, a gentle but continuous electric current is generated, not perceptible to the senses, yet stimulating the nerves and tissues, and producing a curative power over the whole system, and enabling those persons to wear artificial substitutes with comfort who never could before. In the treatment of all diseases from neurasthenia (nerve debility) it will be a most valuable aid."—*Medical Gazette*.

"An ingenious application of the continuous current to dental purposes has just been made by Dr. Wedgwood, who has contrived an arrangement, to be used either with or without artificial teeth, in which what is practically a minute battery, composed of pairs of two metals in very small plates, is worn inside the mouth. The saliva acts as an exciting fluid, and a weak continuous current, localized in the palate and gums, is thus set up."—*Health*.

"Departing somewhat from our subject of electric lighting, it is interesting to note the great strides electricity has made within the past few years in other directions; for instance, we may mention that for some time past Dr. Wedgwood, the American dentist, has used it in his practice as a motive power for delicate operations and to prevent pain."—*International Record*.

